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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/742,386	12/22/2000	Norio Kimura	2000-1761A	8728
513 7590 08/06/2007 WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021			EXAMINER MOORE, KARLA A	
			ART UNIT 1763	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

09/742,386

Applicant(s)

KIMURA ET AL.

Examiner

Karla Moore

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 28-35 and 108-117 is/are pending in the application.
- 4a) Of the above claim(s) 28-35, 108, 109 and 114 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 110-113 and 115-117 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Group II (claims 110-113 and 115-117) in the reply filed on 20 April 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 28-35, 108-109 and 114 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

### ***Double Patenting***

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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4. Claim 111 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 43 of U.S. Patent No. 6,632,325. Although the conflicting claims are not identical, they are not patentably distinct from each other because they claim an apparatus with all the same structure, using slight stylistic and wording differences.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim 111 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,176,992 to Talieh.

7. Talieh disclose providing a plated meal film forming unit for forming a plated film on a semiconductor substrate, comprising: (i) a substrate holding portion (Figure 1, 25—although not illustrated in Figure 2, a support would necessarily be a part of that embodiment, as well), (ii) an anode (Figure 2, 30) disposed above a surface to be plated, (iii) a cathode electrode (Figure 2, 28) for passing an electric current in contact with said substrate when said substrate is held by said substrate holding portion, (iv) a member to be impregnated with plating liquid (Figure 2, 32), said member comprising a

water retaining material (the material is porous and thus retains liquids such as water) and being positioned between said anode and said surface to be plated when said substrate is held by said substrate holding portion, (v) a peripheral seal member (Figure 2, 26) in contact with said substrate and surrounding a part of said member to be impregnated with plating liquid when said substrate is held by said substrate holding portion, wherein said substrate holding portion, said anode, said cathode electrode, said member to be impregnated with plating liquid, and said peripheral seal member are constructed and arranged to form a plated film on said surface, to be plated, of said semiconductor substrate when held by said substrate holding portion, by impregnating said member with said plating liquid, and retaining said plating liquid on said substrate by virtue of said seal member, while passing an electric current through said cathode electrode.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. **Claims 110 and 112 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,267,853 to Dordi et al. (1) in view of U.S. Patent No. 6,231,428 to Maloney et al., U.S. Patent No. 6,309,981 to Mayer et al., U.S. Patent No. 6,176,992 to Talieh and U.S. Patent Publication No. 2002/0157960 A1 to Dordi et al. (2).**

11. Dordi et al. (1) disclose a semiconductor substrate processing apparatus in Figure 3, substantially as claimed and comprising: a carry-in and carry-out section (210; column 5, rows 20) for carrying in and carrying out a semiconductor substrate having a surface on which a circuit is formed, the apparatus is capable of carrying in and out in a dry state by using spin/rinse/dry station (212; column 5, row 24); a plated metal/electroplating film forming unit (240; column 5, rows 41-46) for forming a plated metal film on said semiconductor substrate which has been carried in; a bevel etching unit (one of modules 236; column 9, rows 1-15 and column 10, rows 5-10 and 48-50) for etching a peripheral edge portion of said semiconductor substrate and operable to spin-dry a substrate; and a transport mechanism (216) for transporting said semiconductor substrate between said units. The processing apparatus of Dordi et al. (1) may further comprise an annealing unit (211; column 5, row 20) for annealing said semiconductor substrate.

12. The processing apparatus of Dordi et al. (1) may further comprise a cleaning and drying unit for cleaning and drying said semiconductor substrate (one of modules 238; column 9, rows 1-6 and column 19, rows 5-10). The apparatus also comprises a plating liquid/water supply equipment having a liquid plating tank (220, column 20, rows 51-59). Dordi et al. (1) also teach

that different fluids may be provided to the wafer surfaces and that the wafer is also capable of rotation/spin drying (column 8, rows 24-47).

13. Dordi et al. (1) disclose the invention substantially as claimed and as described above.

14. However, Dordi et al. (1) fail to explicitly teach the use of separate handling mechanisms for substrates in wet and dry states.

15. Maloney et al. teach the use of separate handling mechanisms for wafers in wet and dry states for the purpose of using a separate mechanism for dry (clean) wafers (column 19, rows 11-30). This avoids contamination.

16. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided separate mechanism for wet and dry wafers in Dordi et al. (1) in order to avoid contamination by transferring dry (clean) substrates and wet substrates separately as taught by Maloney et al.

17. Dordi et al. (1) and Maloney et al. disclose the invention substantially as claimed and as described above, including providing a nozzle at the center of a wafer in the bevel etching unit of Dordi et al. (1) for rinsing the wafer.

18. However, Dordi et al. (1) fail to teach the nozzle capable of supplying (operable to supply) an acid solution or a central fluid discharge member connected to a source of acid such that acid is supplied from the acid source to the central fluid discharge member and then to the center portion of the wafer located in the bevel etch unit.

19. Mayer et al. teach providing a nozzle capable of supplying (operable to supply) an acid solution/a central fluid discharge member (Figure 2A, 250) connected to a source of acid (246) such that acid is supplied from the acid source to the central fluid discharge member and then to

the center portion of the wafer located in the bevel etch unit for the purpose of performing an acid rinse that removes residual material and aid in overall cleaning (column 8, rows 1-19).

20. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a nozzle capable of supplying (operable to supply) an acid solution/central fluid discharge member connected to a source of acid such that acid is supplied from the acid source to the central fluid discharge member and then to the center portion of the wafer located in the bevel etch unit in Dordi et al. (1) and Maloney et al. in order to perform an acid rinse that removes residual material and to aid in overall cleaning as taught by Mayer et al.

21. Dordi et al. (1), Maloney et al. and Mayer et al. disclose the invention substantially as claimed and as described above. Dordi et al. (1) further disclose that treatment in said plated film forming unit is performed with said semiconductor held by a (i) substrate holding portion (Figure 6, 450; column 5, rows 45-47).

22. However, Dordi et al. (1), Maloney et al. and Mayer et al. fail to teach other particulars of the claimed invention, for example the plated film forming unit including: (ii) an anode disposed above a surface to be plated, (iii) a cathode electrode for passing an electric current in contact with said substrate when said substrate is held by said substrate holding portion, (iv) a member to be impregnated with plating liquid, said member comprising a water retaining material and being positioned between said anode and said surface to be plated when said substrate is held by said substrate holding portion, (v) a peripheral seal member in contact with said substrate and surrounding a part of said member to be impregnated with plating liquid when said substrate is held by said substrate holding portion, wherein said substrate holding portion, said anode, said cathode electrode, said member to be impregnated with plating liquid, and said peripheral seal member are constructed and arranged to form a plated film on said surface, to



be plated, of said semiconductor substrate when held by said substrate holding portion, by impregnating said member with said plating liquid, and retaining said plating liquid on said substrate by virtue of said seal member, while passing an electric current through said cathode electrode.

23. Talieh disclose providing a plated metal film forming unit for forming a plated film on a semiconductor substrate, comprising: (i) a substrate holding portion (Figure 1, 25—although not illustrated in Figure 2, a support would necessarily be a part of that embodiment, as well), (ii) an anode (Figure 2, 30) disposed above a surface to be plated, (iii) a cathode electrode (Figure 2, 28) for passing an electric current in contact with said substrate when said substrate is held by said substrate holding portion, (iv) a member to be impregnated with plating liquid (Figure 2, 32), said member comprising a water retaining material (the material is porous and thus retains liquids such as water) and being positioned between said anode and said surface to be plated when said substrate is held by said substrate holding portion, (v) a peripheral seal member (Figure 2, 26) in contact with said substrate and surrounding a part of said member to be impregnated with plating liquid when said substrate is held by said substrate holding portion, wherein said substrate holding portion, said anode, said cathode electrode, said member to be impregnated with plating liquid, and said peripheral seal member are constructed and arranged to form a plated film on said surface, to be plated, of said semiconductor substrate when held by said substrate holding portion, by impregnating said member with said plating liquid, and retaining said plating liquid on said substrate by virtue of said seal member, while passing an electric current through said cathode electrode for the purpose of providing an apparatus capable of reducing the need of pulse generating power supplies (column 6, rows 46-50). Talieh also teaches providing a plurality of liquid supplying members for supplying both plating liquid and pure water as needed (Figures 1B and 2, 34 and 44; column 3, rows 42-59)

24. It would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made to have provided a plated metal film forming unit structured as described in Talieh and above in Dordi et al. (1), Maloney et al. and Mayer et al. in order to provide an apparatus capable of reducing the need of pulse generating power supplies as taught by Talieh.

25. Dordi et al. (1), Maloney et al., Mayer et al. and Talieh disclose the invention substantially as claimed and as described above.

26. However, Dordi et al. (1), Maloney et al., Mayer et al. and Talieh fail to teach that the substrate holding portion movable between a plurality of positions.

27. Dordi et al. (2) teach providing a movable substrate holding member in a plating apparatus for the purpose of raising and lowering a substrate so as to correspond to respective operating conditions (paragraph 75).

28. It would have been obvious to one of ordinary skill at the time Applicant's invention was made to have provided movable substrate holder in Dordi et al. (1), Maloney et al., Mayer et al. and Talieh in order to raise and lower a substrate so as to correspond to respective operating conditions as taught by Dordi et al. (2).

29. **Claims 113 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,176,992 to Talieh in view of U.S. Patent Publication No. 2002/0157960 A1 to Dordi et al. (2).**

30. Talieh disclose providing a plated metal film forming unit for forming a plated film on a semiconductor substrate substantially as claimed and comprising: (i) a substrate holding portion (Figure 1, 25—although not illustrated in Figure 2, a support would necessarily be a part of that embodiment, as well), (ii) an anode (Figure 2, 30) disposed above a surface to be plated,

(iii) a cathode electrode (Figure 2, 28) for passing an electric current in contact with said substrate when said substrate is held by said substrate holding portion, (iv) a member to be impregnated with plating liquid (Figure 2, 32), said member comprising a water retaining material (the material is porous and thus retains liquids such as water) and being positioned between said anode and said surface to be plated when said substrate is held by said substrate holding portion, (v) a peripheral seal member (Figure 2, 26) in contact with said substrate and surrounding a part of said member to be impregnated with plating liquid when said substrate is held by said substrate holding portion, wherein said substrate holding portion, said anode, said cathode electrode, said member to be impregnated with plating liquid, and said peripheral seal member are constructed and arranged to form a plated film on said surface, to be plated, of said semiconductor substrate when held by said substrate holding portion, by impregnating said member with said plating liquid, and retaining said plating liquid on said substrate by virtue of said seal member, while passing an electric current through said cathode electrode for the purpose of providing an apparatus capable of reducing the need of pulse generating power supplies (column 6, rows 46-50). Talieh also teaches providing a plurality of liquid supplying members for supplying both plating liquid and pure water as needed (Figures 1B and 2, 34 and 44; column 3, rows 42-59).

31. However, Talieh fails to teach that the substrate holding portion movable between a plurality of positions.

32. Dordi et al. (2) teach providing a movable substrate holding member in a plating apparatus for the purpose of raising and lowering a substrate so as to correspond to respective operating conditions (paragraph 75).

33. It would have been obvious to one of ordinary skill at the time Applicant's invention was made to have provided movable substrate holder in Talieh in order to raise and lower a substrate so as to correspond to respective operating conditions as taught by Dordi et al. (2).

**34. Claims 115 and 117 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,267,853 to Dordi et al. (1) in view of U.S. Patent No. 6,176,992 to Talieh and U.S. Patent Publication No. 2002/0157960 A1 to Dordi et al. (2).**

35. Dordi et al. (1) disclose a semiconductor substrate processing apparatus in Figure 3, substantially as claimed and comprising: a carry-in and carry-out section (210; column 5, rows 20) for carrying in and carrying out a semiconductor substrate having a surface on which a circuit is formed, the apparatus is capable of carrying in and out in a dry state by using spin/rinse/dry station (212; column 5, row 24); a plated metal/electroplating film forming unit (240; column 5, rows 41-46) for forming a plated metal film on said semiconductor substrate which has been carried in; a bevel etching unit (one of modules 236; column 9, rows 1-15 and column 10, rows 5-10 and 48-50) for etching a peripheral edge portion of said semiconductor substrate and operable to spin-dry a substrate; and a transport mechanism (216) for transporting said semiconductor substrate between said units. The processing apparatus of Dordi et al. (1) may further comprise an annealing unit (211; column 5, row 20) for annealing said semiconductor substrate.

36. The processing apparatus of Dordi et al. (1) may further comprise a cleaning and drying unit for cleaning and drying said semiconductor substrate (one of modules 238; column 9, rows 1-6 and column 19, rows 5-10). The apparatus also comprises a plating liquid/water supply equipment having a liquid plating tank (220, column 20, rows 51-59). Dordi et al. (1) also teach

that different fluids may be provided to the wafer surfaces and that the wafer is also capable of rotation/spin drying (column 8, rows 24-47).

37. Dordi et al. (1) disclose the invention substantially as claimed and as described above. Dordi et al. (1) further disclose that treatment in said plated film forming unit is performed with said semiconductor held by a (i) substrate holding portion (Figure 6, 450; column 5, rows 45-47).

38. However, Dordi et al. (1) fail to teach other particulars of the claimed invention, for example the plated film forming unit including: (ii) an anode disposed above a surface to be plated, (iii) a cathode electrode for passing an electric current in contact with said substrate when said substrate is held by said substrate holding portion, (iv) a member to be impregnated with plating liquid, said member comprising a water retaining material and being positioned between said anode and said surface to be plated when said substrate is held by said substrate holding portion, (v) a peripheral seal member in contact with said substrate and surrounding a part of said member to be impregnated with plating liquid when said substrate is held by said substrate holding portion, wherein said substrate holding portion, said anode, said cathode electrode, said member to be impregnated with plating liquid, and said peripheral seal member are constructed and arranged to form a plated film on said surface, to be plated, of said semiconductor substrate when held by said substrate holding portion, by impregnating said member with said plating liquid, and retaining said plating liquid on said substrate by virtue of said seal member, while passing an electric current through said cathode electrode.

39. Talieh disclose providing a plated metal film forming unit for forming a plated film on a semiconductor substrate, comprising: (i) a substrate holding portion (Figure 1, 25—although not illustrated in Figure 2, a support would necessarily be a part of that embodiment, as well), (ii) an

anode (Figure 2, 30) disposed above a surface to be plated, (iii) a cathode electrode (Figure 2, 28) for passing an electric current in contact with said substrate when said substrate is held by said substrate holding portion, (iv) a member to be impregnated with plating liquid (Figure 2, 32), said member comprising a water retaining material (the material is porous and thus retains liquids such as water) and being positioned between said anode and said surface to be plated when said substrate is held by said substrate holding portion, (v) a peripheral seal member (Figure 2, 26) in contact with said substrate and surrounding a part of said member to be impregnated with plating liquid when said substrate is held by said substrate holding portion, wherein said substrate holding portion, said anode, said cathode electrode, said member to be impregnated with plating liquid, and said peripheral seal member are constructed and arranged to form a plated film on said surface, to be plated, of said semiconductor substrate when held by said substrate holding portion, by impregnating said member with said plating liquid, and retaining said plating liquid on said substrate by virtue of said seal member, while passing an electric current through said cathode electrode for the purpose of providing an apparatus capable of reducing the need of pulse generating power supplies (column 6, rows 46-50). Talieh also teaches providing a plurality of liquid supplying members for supplying both plating liquid and pure water as needed (Figures 1B and 2, 34 and 44; column 3, rows 42-59)

40. It would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made to have provided a plated metal film forming unit structured as described in Talieh and above in Dordi et al. in order to provide an apparatus capable of reducing the need of pulse generating power supplies as taught by Talieh.

41. Dordi et al. (1) and Talieh disclose the invention substantially as claimed and as described above.

42. However, Dordi et al. and Talieh fail to teach that the substrate holding portion movable between a plurality of positions.

43. Dordi et al. (2) teach providing a movable substrate holding member in a plating apparatus for the purpose of raising and lowering a substrate so as to correspond to respective operating conditions (paragraph 75).

44. It would have been obvious to one of ordinary skill at the time Applicant's invention was made to have provided movable substrate holder in Dordi et al. (1) and Talieh in order to raise and lower a substrate so as to correspond to respective operating conditions as taught by Dordi et al. (2).

**45. Claim 116 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,267,853 to Dordi et al. (1) in view of U.S. Patent No. 6,231,428 to Maloney et al., U.S. Patent No. 6,176,992 to Talieh and U.S. Patent Publication No. 2002/0157960 A1 to Dordi et al. (2).**

46. Dordi et al. (1) disclose a semiconductor substrate processing apparatus in Figure 3, substantially as claimed and comprising: a carry-in and carry-out section (210; column 5, rows 20) for carrying in and carrying out a semiconductor substrate having a surface on which a circuit is formed, the apparatus is capable of carrying in and out in a dry state by using spin/rinse/dry station (212; column 5, row 24); a plated metal/electroplating film forming unit (240; column 5, rows 41-46) for forming a plated metal film on said semiconductor substrate which has been carried in; a bevel etching unit (one of modules 236; column 9, rows 1-15 and column 10, rows 5-10 and 48-50) for etching a peripheral edge portion of said semiconductor substrate and operable to spin-dry a substrate; and a transport mechanism (216) for transporting said semiconductor substrate between said units. The processing apparatus of

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Dordi et al. (1) may further comprise an annealing unit (211; column 5, row 20) for annealing said semiconductor substrate.

47. The processing apparatus of Dordi et al. (1) may further comprise a cleaning and drying unit for cleaning and drying said semiconductor substrate (one of modules 238; column 9, rows 1-6 and column 19, rows 5-10). The apparatus also comprises a plating liquid/water supply equipment having a liquid plating tank (220, column 20, rows 51-59). Dordi et al. (1) also teach that different fluids may be provided to the wafer surfaces and that the wafer is also capable of rotation/spin drying (column 8, rows 24-47).

48. Dordi et al. (1) disclose the invention substantially as claimed and as described above.

49. However, Dordi et al. (1) fail to explicitly teach the use of separate handling mechanisms for substrates in wet and dry states.

50. Maloney et al. teach the use of separate handling mechanisms for wafers in wet and dry states for the purpose of using a separate mechanism for dry (clean) wafers (column 19, rows 11-30). This avoids contamination.

51. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided separate mechanism for wet and dry wafers in Dordi et al. (1) in order to avoid contamination by transferring dry (clean) substrates and wet substrates separately as taught by Maloney et al.

52. Dordi et al. (1) and Maloney et al. disclose the invention substantially as claimed and as described above. Dordi et al. (1) further disclose that treatment in said plated film forming unit is performed with said semiconductor held by a (i) substrate holding portion (Figure 6, 450; column 5, rows 45-47).



53. However, Dordi et al. (1) and Maloney et al. fail to teach other particulars of the claimed invention, for example the plated film forming unit including: (ii) an anode disposed above a surface to be plated, (iii) a cathode electrode for passing an electric current in contact with said substrate when said substrate is held by said substrate holding portion, (iv) a member to be impregnated with plating liquid, said member comprising a water retaining material and being positioned between said anode and said surface to be plated when said substrate is held by said substrate holding portion, (v) a peripheral seal member in contact with said substrate and surrounding a part of said member to be impregnated with plating liquid when said substrate is held by said substrate holding portion, wherein said substrate holding portion, said anode, said cathode electrode, said member to be impregnated with plating liquid, and said peripheral seal member are constructed and arranged to form a plated film on said surface, to be plated, of said semiconductor substrate when held by said substrate holding portion, by impregnating said member with said plating liquid, and retaining said plating liquid on said substrate by virtue of said seal member, while passing an electric current through said cathode electrode.

54. Talieh disclose providing a plated metal film forming unit for forming a plated film on a semiconductor substrate, comprising: (i) a substrate holding portion (Figure 1, 25—although not illustrated in Figure 2, a support would necessarily be a part of that embodiment, as well), (ii) an anode (Figure 2, 30) disposed above a surface to be plated, (iii) a cathode electrode (Figure 2, 28) for passing an electric current in contact with said substrate when said substrate is held by said substrate holding portion, (iv) a member to be impregnated with plating liquid (Figure 2, 32), said member comprising a water retaining material (the material is porous and thus retains liquids such as water) and being positioned between said anode and said surface to be plated when said substrate is held by said substrate holding portion, (v) a peripheral seal member (Figure 2, 26) in contact with said substrate and surrounding a part of said member to be

impregnated with plating liquid when said substrate is held by said substrate holding portion, wherein said substrate holding portion, said anode, said cathode electrode, said member to be impregnated with plating liquid, and said peripheral seal member are constructed and arranged to form a plated film on said surface, to be plated, of said semiconductor substrate when held by said substrate holding portion, by impregnating said member with said plating liquid, and retaining said plating liquid on said substrate by virtue of said seal member, while passing an electric current through said cathode electrode for the purpose of providing an apparatus capable of reducing the need of pulse generating power supplies (column 6, rows 46-50). Talieh also teaches providing a plurality of liquid supplying members for supplying both plating liquid and pure water as needed (Figures 1B and 2, 34 and 44; column 3, rows 42-59)

55. It would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made to have provided a plated metal film forming unit structured as described in Talieh and above in Dordi et al. (1) and Maloney et al. in order to provide an apparatus capable of reducing the need of pulse generating power supplies as taught by Talieh.

56. Dordi et al. (1), Maloney et al., and Talieh disclose the invention substantially as claimed and as described above.

57. However, Dordi et al. (1), Maloney et al., and Talieh fail to teach that the substrate holding portion movable between a plurality of positions.

58. Dordi et al. (2) teach providing a movable substrate holding member in a plating apparatus for the purpose of raising and lowering a substrate so as to correspond to respective operating conditions (paragraph 75).

59. It would have been obvious to one of ordinary skill at the time Applicant's invention was made to have provided movable substrate holder in Dordi et al. (1), Maloney et al. and Talieh in

order to raise and lower a substrate so as to correspond to respective operating conditions as taught by Dordi et al. (2).

**60. Claims 117 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,267,853 to Dordi et al. (1) in view of U.S. Patent No. 6,231,428 to Maloney et al., U.S. Patent No. 6,309,981 to Mayer et al., U.S. Patent No. 6,176,992 to Talieh and U.S. Patent Publication No. 2002/0157960 A1 to Dordi et al. (2).**

61. Dordi et al. (1) disclose a semiconductor substrate processing apparatus in Figure 3, substantially as claimed and comprising: a carry-in and carry-out section (210; column 5, rows 20) for carrying in and carrying out a semiconductor substrate having a surface on which a circuit is formed, the apparatus is capable of carrying in and out in a dry state by using spin/rinse/dry station (212; column 5, row 24); a plated metal/electroplating film forming unit (240; column 5, rows 41-46) for forming a plated metal film on said semiconductor substrate which has been carried in; a bevel etching unit (one of modules 236; column 9, rows 1-15 and column 10, rows 5-10 and 48-50) for etching a peripheral edge portion of said semiconductor substrate and operable to spin-dry a substrate; and a transport mechanism (216) for transporting said semiconductor substrate between said units. The processing apparatus of Dordi et al. (1) may further comprise an annealing unit (211; column 5, row 20) for annealing said semiconductor substrate.

62. The processing apparatus of Dordi et al. (1) may further comprise a cleaning and drying unit for cleaning and drying said semiconductor substrate (one of modules 238; column 9, rows 1-6 and column 19, rows 5-10). The apparatus also comprises a plating liquid/water supply equipment having a liquid plating tank (220, column 20, rows 51-59). Dordi et al. (1) also teach

that different fluids may be provided to the wafer surfaces and that the wafer is also capable of rotation/spin drying (column 8, rows 24-47).

63. Dordi et al. (1) disclose the invention substantially as claimed and as described above.

64. However, Dordi et al. (1) fail to explicitly teach the use of separate handling mechanisms for substrates in wet and dry states.

65. Maloney et al. teach the use of separate handling mechanisms for wafers in wet and dry states for the purpose of using a separate mechanism for dry (clean) wafers (column 19, rows 11-30). This avoids contamination.

66. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided separate mechanism for wet and dry wafers in Dordi et al. (1) in order to avoid contamination by transferring dry (clean) substrates and wet substrates separately as taught by Maloney et al.

67. Dordi et al. (1) and Maloney et al. disclose the invention substantially as claimed and as described above, including providing a nozzle at the center of a wafer in the bevel etching unit of Dordi et al. (1) for rinsing the wafer.

68. However, Dordi et al. (1) fail to teach the nozzle capable of supplying (operable to supply) an acid solution or a central fluid discharge member connected to a source of acid such that acid is supplied from the acid source to the central fluid discharge member and then to the center portion of the wafer located in the bevel etch unit.

69. Mayer et al. teach providing a nozzle capable of supplying (operable to supply) an acid solution/a central fluid discharge member (Figure 2A, 250) connected to a source of acid (246) such that acid is supplied from the acid source to the central fluid discharge member and then to

the center portion of the wafer located in the bevel etch unit for the purpose of performing an acid rinse that removes residual material and aid in overall cleaning (column 8, rows 1-19).

70. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a nozzle capable of supplying (operable to supply) an acid solution/central fluid discharge member connected to a source of acid such that acid is supplied from the acid source to the central fluid discharge member and then to the center portion of the wafer located in the bevel etch unit in Dordi et al. (1) and Maloney et al. in order to perform an acid rinse that removes residual material and to aid in overall cleaning as taught by Mayer et al.

71. Dordi et al. (1), Maloney et al. and Mayer et al. disclose the invention substantially as claimed and as described above. Dordi et al. (1) further disclose that treatment in said plated film forming unit is performed with said semiconductor held by a (i) substrate holding portion (Figure 6, 450; column 5, rows 45-47).

72. However, Dordi et al. (1), Maloney et al. and Mayer et al. fail to teach other particulars of the claimed invention, for example the plated film forming unit including: (ii) an anode disposed above a surface to be plated, (iii) a cathode electrode for passing an electric current in contact with said substrate when said substrate is held by said substrate holding portion, (iv) a member to be impregnated with plating liquid, said member comprising a water retaining material and being positioned between said anode and said surface to be plated when said substrate is held by said substrate holding portion, (v) a peripheral seal member in contact with said substrate and surrounding a part of said member to be impregnated with plating liquid when said substrate is held by said substrate holding portion, wherein said substrate holding portion, said anode, said cathode electrode, said member to be impregnated with plating liquid, and said peripheral seal member are constructed and arranged to form a plated film on said surface, to

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be plated, of said semiconductor substrate when held by said substrate holding portion, by impregnating said member with said plating liquid, and retaining said plating liquid on said substrate by virtue of said seal member, while passing an electric current through said cathode electrode.

73. Talieh disclose providing a plated metal film forming unit for forming a plated film on a semiconductor substrate, comprising: (i) a substrate holding portion (Figure 1, 25—although not illustrated in Figure 2, a support would necessarily be a part of that embodiment, as well), (ii) an anode (Figure 2, 30) disposed above a surface to be plated, (iii) a cathode electrode (Figure 2, 28) for passing an electric current in contact with said substrate when said substrate is held by said substrate holding portion, (iv) a member to be impregnated with plating liquid (Figure 2, 32), said member comprising a water retaining material (the material is porous and thus retains liquids such as water) and being positioned between said anode and said surface to be plated when said substrate is held by said substrate holding portion, (v) a peripheral seal member (Figure 2, 26) in contact with said substrate and surrounding a part of said member to be impregnated with plating liquid when said substrate is held by said substrate holding portion, wherein said substrate holding portion, said anode, said cathode electrode, said member to be impregnated with plating liquid, and said peripheral seal member are constructed and arranged to form a plated film on said surface, to be plated, of said semiconductor substrate when held by said substrate holding portion, by impregnating said member with said plating liquid, and retaining said plating liquid on said substrate by virtue of said seal member, while passing an electric current through said cathode electrode for the purpose of providing an apparatus capable of reducing the need of pulse generating power supplies (column 6, rows 46-50). Talieh also teaches providing a plurality of liquid supplying members for supplying both plating liquid and pure water as needed (Figures 1B and 2, 34 and 44; column 3, rows 42-59)

74. It would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made to have provided a plated metal film forming unit structured as described in Talieh and above in Dordi et al. (1), Maloney et al. and Mayer et al. in order to provide an apparatus capable of reducing the need of pulse generating power supplies as taught by Talieh.

75. Dordi et al. (1), Maloney et al., Mayer et al. and Talieh disclose the invention substantially as claimed and as described above.

76. However, Dordi et al. (1), Maloney et al., Mayer et al. and Talieh fail to teach that the substrate holding portion movable between a plurality of positions.

77. Dordi et al. (2) teach providing a movable substrate holding member in a plating apparatus for the purpose of raising and lowering a substrate so as to correspond to respective operating conditions (paragraph 75).

78. It would have been obvious to one of ordinary skill at the time Applicant's invention was made to have provided movable substrate holder in Dordi et al. (1), Maloney et al., Mayer et al. and Talieh in order to raise and lower a substrate so as to correspond to respective operating conditions as taught by Dordi et al. (2).

#### ***Response to Arguments***

79. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karla Moore  
Primary Examiner  
Art Unit 1763  
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